In the case of the perihelia no other two semicircles give a greater disproportion between the numbers. The semicircle 355° to 175° contains 37 of the nodes, the opposite one 13.

But in addition to this development of my original plan regarding the heliocentric longitudes of the perihelia and nodes, Mr. Graham has found a remarkable coincidence between the foregoing numbers and the periods of the discovery of the small planets. It appears that 28 have been detected between the vernal and autumnal equinoxes, and only 15 in the other half-year.

He states that this circumstance, which at a first glance might seem to throw some light upon the facts, proves, after a moment's consideration, the exact opposite to what might have been expected, at least in its bearing on the perihelia, for

	180° to 360°.	0° to 100°.
Longitudes of Aphelia	29	14
Longitudes of descending Nodes ..	28	15
Point of Ecliptic in opposition at date of discovery	28	15

"If, then," Mr. Graham adds, "there be any connexion between these results, it is not easy to imagine why discoveries should be more frequent near the *descending* node; and it is quite contradictory that there should be a greater facility of finding the planets in the more remote parts of their orbits." Upon these facts I abstain from making any comment, excepting that the present data tend to strengthen the conviction that some physical cause, as yet unapplied to these phenomena, may be in operation. Appended to this paper are two diagrams, bringing before the eye more clearly than numbers, the heliocentric places of the perihelia and nodes which are the subjects of this notice.

XVIII. "On the Development of *Carcinus Mænas*." By Spence Bate, Esq., F.L.S. Communicated by Sir W. Snow Harris, F.R.S. Received May 1st 1857.

(Abstract.)

The author, after noticing the history of the subject, and the

opposition which the assertion, "that the *Zoë* of naturalists is the larva of a common crab," received, traces the progress of the development of the animal from the *Zœa* to the adult, and endeavours to demonstrate, that from the youngest to the most perfect form, the changes are the result of no sudden transformation, but produced by a gradual series of alterations contemporary with every succeeding moult; that the *Zœa* is connected with the *Megalopa*, and the latter with the adult by many intermediate gradations, each in itself scarcely appreciable, and progressively approximating nearer and nearer the more perfect stages.

The author asserts that the development is earliest and most complete anteriorly; that when first born, the seventh or posterior segment of the head, one or more of the posterior segments of the *pereion* (thorax), and the penultimate of the *pleon* (abdomen) are wanting in the brachyurous Decapods; but that this general law loses somewhat of its force in the descending scale of development; and as it becomes less persistent, the animal approximates in the larval condition nearer to the form of the adult type; while on the other hand, the same appears to be a constant law of the depreciation in adult forms, as exhibited in the more or less aberrant Amphipoda, such as *Cyrtophium*, *Dulichia*, &c. The author likewise shows that the appendages, which act the principal parts in the larvæ, become the secondary parts of the same organs in the perfect animal. For instance, the lower antenna is represented in the larva by the complementary appendage of the adult form; the true antenna is developed from the base of the embryonic organ, which represents the squamiform and spinous appendages, more or less constant in the mucrourous Decapods, but lost in the short-tailed genera, and the organ itself is gradually increased with every successive moult. This is true, more or less perfectly, of all the other appendages present in the larvæ of all Decapoda; and no change of form, as understood in the term metamorphosis as applied to insects, takes place in the development of *Carcinus*. That the distance between the old and young forms is the result of an exaggeration of parts in the larva as compared with the relative proportion of the same in adult animals, together with the absence of others, which are gradually produced, and assume the permanent condition of the adult type.

The author has observed the rudiments of the future legs shortly

after birth. He has dissected and figured eight or nine of the more important stages, and shown the relative alteration of each part consecutively, commencing with the *Zœa* taken from the egg, and pursued the observations through the older forms to that of the adult *Carcinus*.

The paper is carefully illustrated by drawings made by the author.

XIX. "On the Electro-dynamic Qualities of Metals:—Effects of Magnetization on the Electric Conductivity of Nickel and of Iron." By Professor W. THOMSON, F.R.S. Received June 18, 1857.

I have already communicated to the Royal Society a description of experiments by which I found that iron, when subjected to magnetic force, acquires an increase of resistance to the conduction of electricity along, and a diminution of resistance to the conduction of electricity across, the lines of magnetization*. By experiments more recently made, I have ascertained that the electric conductivity of nickel is similarly influenced by magnetism, but to a greater degree, and with a curious difference from iron in the relative magnitudes of the transverse and longitudinal effects.

In these experiments the effect of transverse magnetization was first tested on a little rectangular piece of nickel 1·2 inch long, ·52 of an inch broad, and ·12 thick, being the "keeper" of the nickel horse-shoe (§ 143) belonging to the Industrial Museum of Edinburgh, and put at my disposal for experimental purposes through the kindness of Dr. George Wilson. Exactly the method described in § 175 of my previous communication referred to above, was followed, and the result, readily found on the first trial, was as stated.

The effect of longitudinal magnetization on nickel was first found with some difficulty, by an arrangement with the horse-shoe itself, and magnetizing helix (§ 143), the former furnished with suitable electrodes for a powerful current through itself, and the system treated in all respects (including cooling by streams of cold water) as described in § 156, for a correspondiug experiment on iron. The

* See Phil. Trans. Bakerian Lecture, "On the Electro-dynamic Qualities of Metals," Feb. 27, 1856, § 146 of Part 4 and Part 5. In the present communication that paper will be referred to simply by the sectional (§) numbers.